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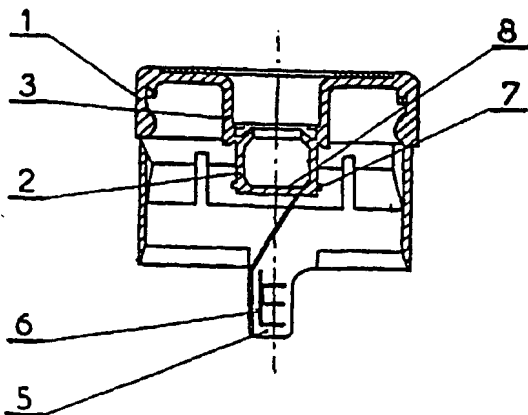
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(54) Title: A CLOSURE FOR A BOTTLE OR OTHER CONTAINERS, AND A METHOD FOR MANUFACTURING SAME



(57) Abstract: A plastic cover for a bottle consisting of a cylindrical cap with a belt grip, and having a coaxial cylindrical tube stub directed inside, as well as of a hollow cylindrical plug, characterized in that said cylindrical plug (2) is connected to said cylindrical tube stub (3) of said cap (1) by means of a means to be broken, advantageously in a shape of a shape of a circular connecting film (4). A method consists in that said cylindrical plug 2 having a circular flange (7) together with said cylindrical cap (1) are injection formed in an injection mould, wherein after injection a motion of a forming male die (12) is caused in relation to a forming plate (16) to release an outer cylindrical surface of said cap (1), and at the same time an ejector (17) supporting the bottom (8) of the cylindrical plug (2) is slid so as to achieve a simultaneous cylindrical cap (1) and the plug (2) connected one to another by means of the connecting film (4) from the injection mould, and then the closure is blown with compressed air in order to reliably eject it from said injection mould.

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A CLOSURE FOR A BOTTLE OR OTHER CONTAINERS, AND A METHOD FOR MANUFACTURING SAME

This invention relates to a bottle closure to be put onto a water dispenser, and a method for manufacturing such a closure for bottles or other containers.

A plastic cap-and-plug for a bottle is known comprised of a hollow plug with a closed bottom and a cylindrical cap having a cover provided with a coaxial through stub pipe leading inside a cylindrical lateral part of the cap, and forming an entity together with that lateral part of the cap. Said plug, and said cap are connected one to another by their snap action. On said lateral cylindrical part of a cap a small channel is formed reducing a cross section and extending around the cap perimeter till a belt grip.

From the US patent 5,392,939 a closure is also known for bottles or other containers to be mounted onto a stub pipe of a receiving valve or a liquid receiving means.

A plastic closure is comprised of a cylindrical cap, a cover of which has a downward directed coaxial cylindrical stub pipe onto which there is snap mounted a plug having a shape of a dish with an outside ring flange forming a circular cavity.

The known methods for manufacturing a closure for containers consisted in that a cap was made by injection forming, and a plug was made separately, and then these parts were snap connected together. Separate injection molds were used in that method.

A plastic closure consisted of a cylindrical cap with a belt grip, said cap having an inside directed coaxial cylindrical stub pipe, and of a hollow cylindrical plug is according to the invention characterized in that said cylindrical plug is connected to a cylindrical stub pipe of a cap by means of a breakable means, advantageously in form of a circular connecting film. This circular connecting film is located at the end of the cylindrical stub pipe of the cap. The cylindrical plug has a circular flange situated above the bottom. A belt grip of a cap has inside a stiffening bead formed of horizontal beads connected by a lateral vertical bead.

A method for manufacturing a closure for bottles or other containers according to the invention is characterized in that a cylindrical plug having a circular flange located above a plug bottom together with a cylindrical cap are formed by injection in an injection mould, wherein after injection a forming male die is put in motion in relation to a forming plate in order to release the outer cylindrical surface of the cap, and an ejector supporting the bottom of the cylindrical plug is simultaneously slid so that when the cylindrical cap is finally released from an injection mould, connected by a connecting film, an ejecting sleeve and an ejector are working simultaneously, and afterwards the closure is blown with compressed air in order to achieve its reliable ejection from the injection mould.

It is easy and comfortable to use the closure according to the invention. In a moment of putting a bottle onto a water dispenser a connecting film is reliably broken as a safety seal, and at the same time the seal of a container is better.

A method according to the invention is simple in realization, and ensures releasing the entire cap and plug from an injection mould.

An embodiment of the invention is shown in the drawings, where Fig. 1 is a closure in its vertical section, Fig. 2 is an enlargement of a cap fragment in a vertical section showing a plug connected with a stub pipe of a cap by means of a connecting film, Fig. 3, Fig. 4, and Fig. 5 depict successive phases of the operation of the injection mould in a vertical projection partially in cross-section.

A plastic closure consists of a cylindrical cap 1 and a hollow cylindrical plug 2. The cylindrical cap 1 has a coaxial cylindrical stub pipe 3 directed inside it, as well as a tangential to its outer surface belt grip 5, having at its inner side stiffening horizontal beads connected laterally by means of a vertical bead. The cylindrical plug 2 has circular flange 7 above its bottom 8, and it is connected to the stub pipe 3 of the cap 1 by means of a breakable means in form of a circular connecting film 4 situated at the end of the stub pipe 3 of the cap 1.

A method for manufacturing a closure is characterized in that the cylindrical plug 2 having an circular flange 7 located above the bottom together with the cylindrical cap 1 are formed by injection in an injection mould.

This method consists in that after injection the mould is opened at the separation place I shown in fig. 3, the face surface of the cylindrical cap 1 and the inner part of the cylindrical plug 2, and at the same time the plate 11 together with the forming male die 12 connected to it are pulled by means of the pulling rod. The pulled plate 11 together with the forming male die 12 connected to it release the cylindrical outside surface of the cap 1 formed in the plate 16. Moreover, the pulled plate 11 shown in Fig. 4 together with the forming male die 12 connected to it push the ejecting sleeve 13 which enables the simultaneous movement II (shown in Fig. 3) thanks to the element 18 connecting with a ejecting plate 10. Such a simultaneous movement of the ejecting plate 10 together with the plate 11 makes it able the ejector 17 to be moved simultaneously with the forming male die 12, and to support the bottom

8 of the cylindrical plug 2. The bottom 8 is supported by the ejector 17 in order to protect the cylindrical plug 2 against breaking the connecting film 4. On stopping the plate 11 (shown in Fig. 4) at the moment of touching the forming plate 16 the ejecting plate 10 is stopped too. Now the movement III (shown in Fig. 3) starts brought about by the mandrel 9. The ejecting plate 10 being pulled till begins now to push the ejecting sleeve 13 and at the same time the ejector 17. The movement III (shown in Fig. 3) of the ejecting plate 15 releases by means of the ejecting sleeve 13 (Fig. 5) and the ejector 17 entirely the cylindrical cap 1 and the cylindrical plug 2 from the injection mould.

The closure is additionally blown with compressed air in order to be reliably ejected from the mould. The injection mould to be used in this method shown in its embodiment in the drawing consists of the mandrel 9, ejecting plate 10, plate 11, forming male die 12, ejecting sleeve 13, base plate 14, pulling rod 15, ejector 17 and the connecting means 18.

Parts list

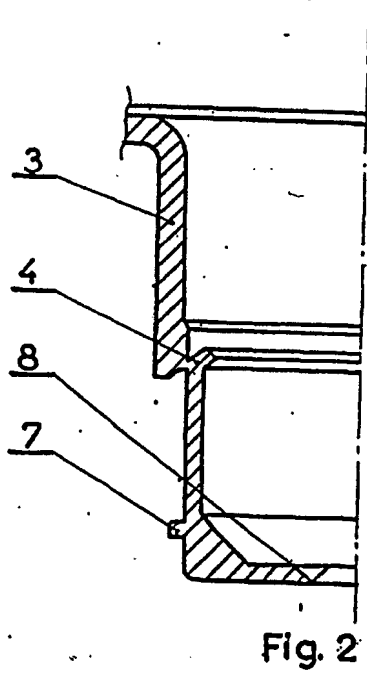
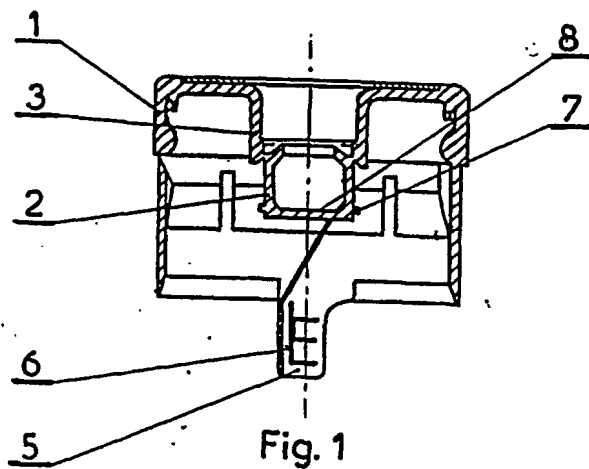
- 1 - cylindrical cap
- 2 - cylindrical plug
- 3 - cylindrical stub pipe
- 4 - connecting film
- 5 - belt grip
- 6 - stiffening bead
- 7 - circular flange
- 8 - bottom of a plug
- 9 - mandrel
- 10 - ejecting plate
- 11- plate
- 12 - forming male die
- 13 - ejecting sleeve
- 14 - base plate
- 15- pulling rod
- 16 - forming plate
- 17- ejector
- 18 - connecting means

Claims

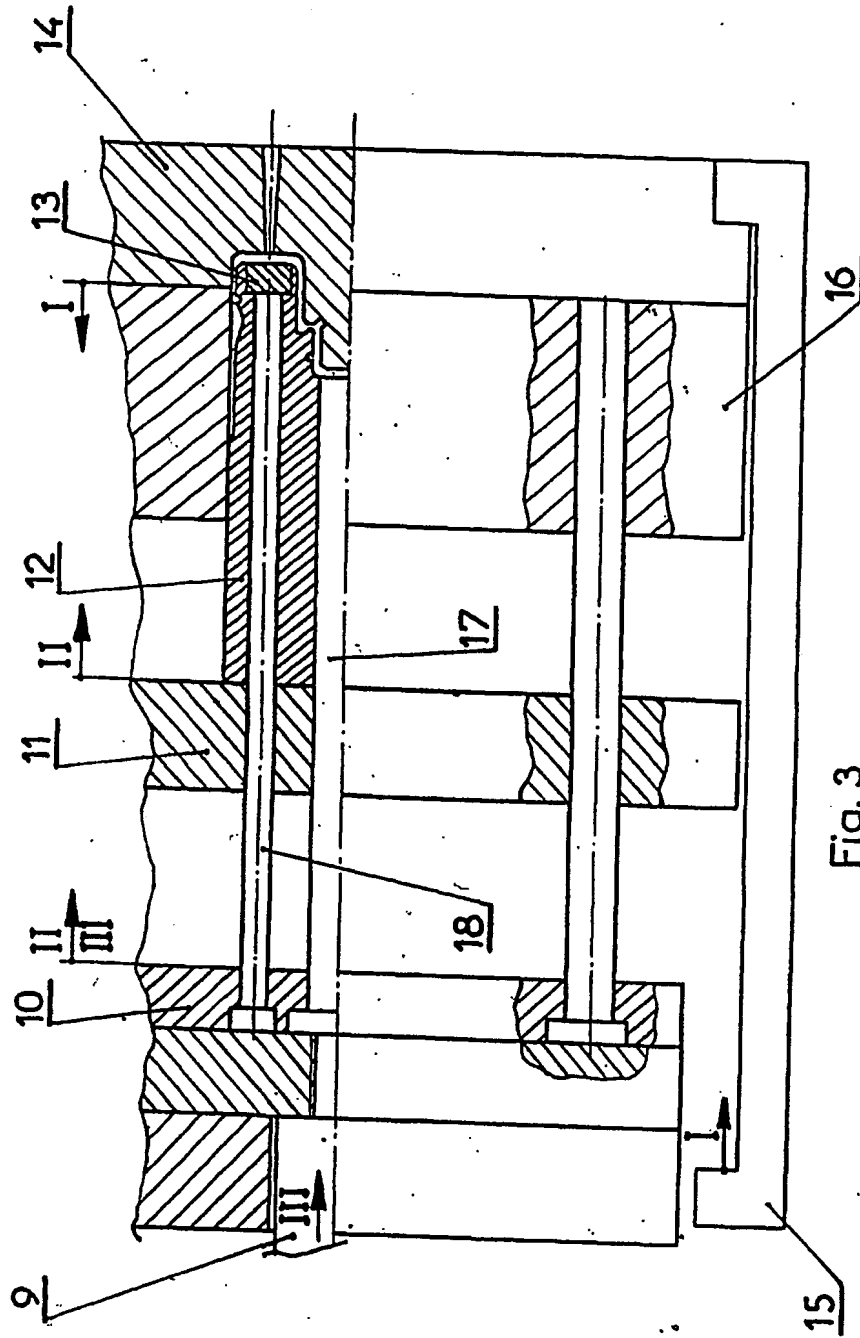
1. A plastic closure for bottles and other containers consisting of a cylindrical cap with a belt grip, said cap having a coaxial cylindrical stub pipe directed inside it, and of a hollow cylindrical plug, characterized in that said cylindrical plug (2) is connected with a cylindrical stub pipe (3) of a cap (1) by means of a breakable means, advantageously in form of a connecting film (4).
2. A closure according to Claim 1, characterized in that said circular connecting film (4) is situated at the end of said stub pipe (3) of said cap (1).
3. A closure according to Claim 1, characterized in that said cylindrical plug (2) has an circular flange (7) above the bottom (8).
4. A closure according to Claim 1, characterized in that said belt grip (5) of said cap (1) has at its inner side a stiffening bead (6) formed of horizontal beads connected laterally by a vertical bead.
5. A method for manufacturing a closure for bottles or other containers, characterized in that said cylindrical plug (2) is formed together with a cylindrical cap (1) by injection in an injection mould, wherein after injection a

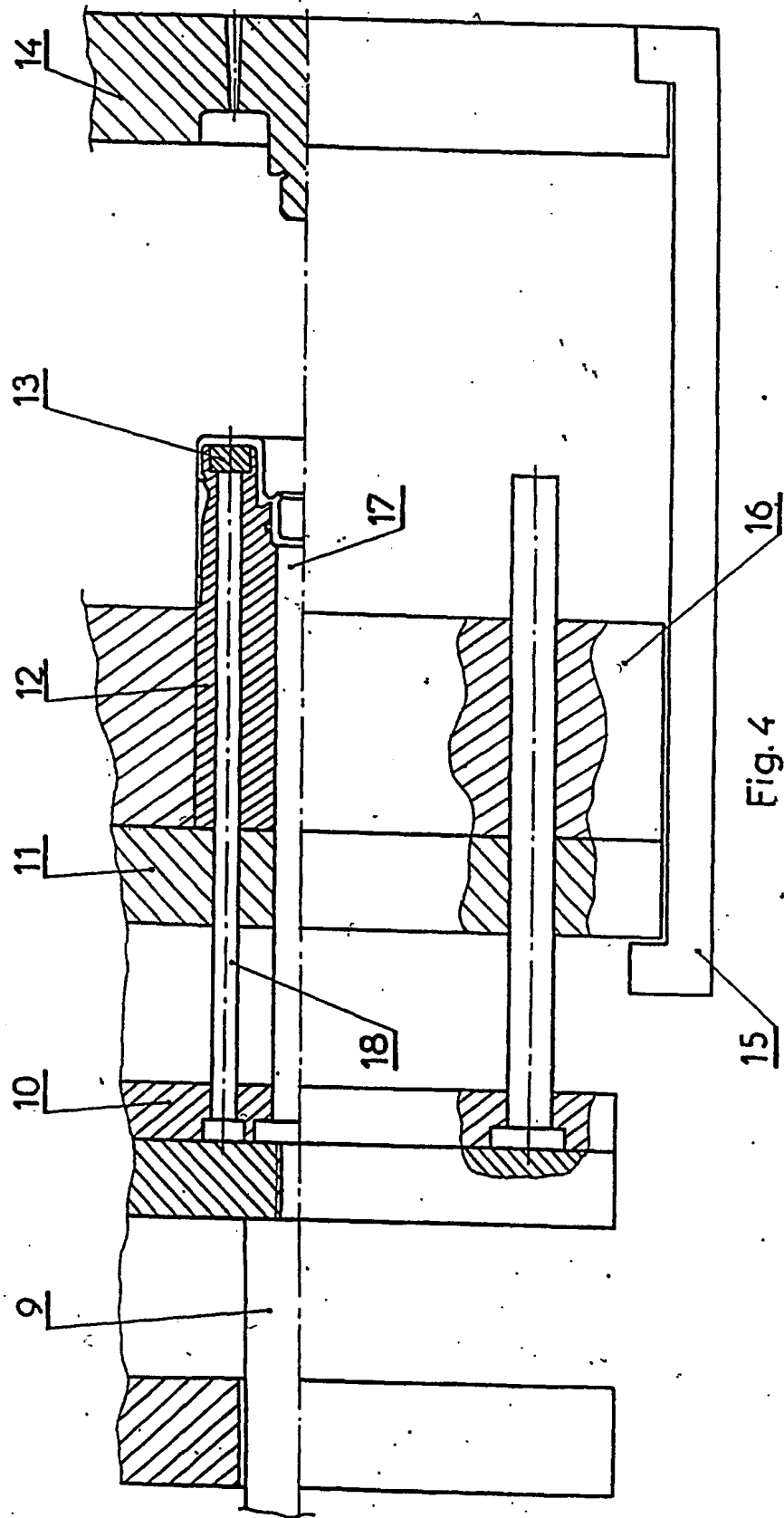
motion of a forming male die (12) is caused in relation to a forming plate (16) to release an outer cylindrical surface of said cap (1), and at the same time an ejector (17) supporting the bottom (8) of the cylindrical plug (2) is slid so as to achieve a simultaneous action of the ejecting sleeve (13) and the ejector (17) when finally releasing from the injection mould the cylindrical cap (1) and the plug (2) connected one to another by means of the connecting film (4), and then the closure is blown with compressed air in order to reliably eject it from said injection mould.

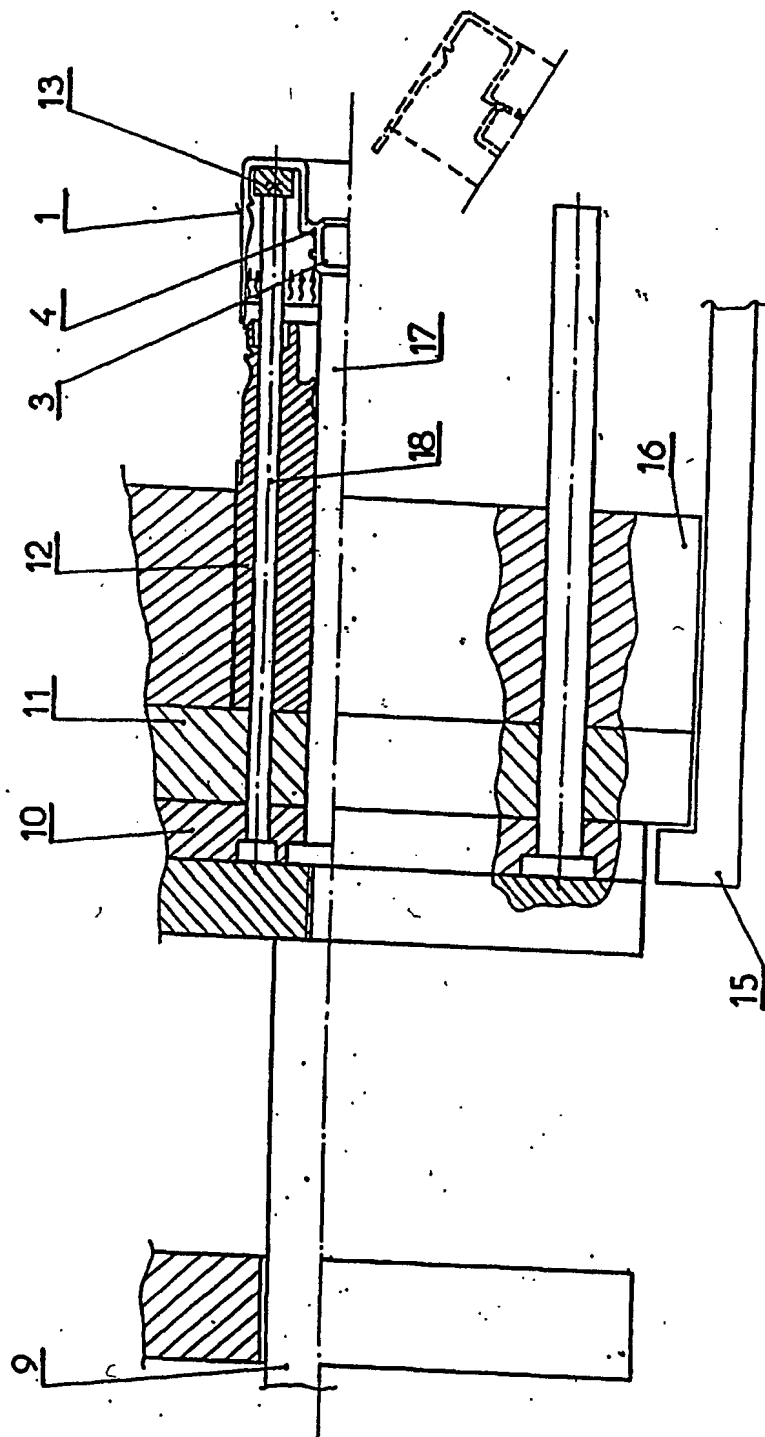
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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 B67D3/00 B29C45/44 B29C45/43		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 B67D B29C B65D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 273 083 A (BURROWS BRUCE D) 28 December 1993 (1993-12-28)	1-3
Y	column 6, line 67 -column 7, line 32; figures 3,6,9	4,5
Y	WO 91 13813 A (EWIT AG) 19 September 1991 (1991-09-19) page 3, line 35 -page 4, line 6; figures 3,6	4
Y	US 3 940 103 A (HILAIRE FERNAND) 24 February 1976 (1976-02-24) the whole document	5
X	US 5 222 530 A (BAKER HENRY E ET AL) 29 June 1993 (1993-06-29) column 4, line 42 -column 6, line 35; figures 4A,4B,4C	1-3
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
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Date of the actual completion of the international search		Date of mailing of the international search report
3 October 2001		10/10/2001
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer Schneider, M

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